Comic-based Digital Storytelling with Primary School Children

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ABSTRACT

In this paper, we describe a pilot study of a digital storytelling project conducted with primary school children. The study investigates how comic-based storytelling supported by a digital tool, named *Communics*, can facilitate primary school children in creating stories and in reflecting on situations involving discrimination within the classroom context. In a first stage, two teachers have been involved to negotiate the intervention, as well as define graphical and textual content on which to base the narrations in *Communics*. In a second stage, we piloted an intervention within a class of 12 children to investigate the scaffolding opportunities offered by *Communics* as well as different aspects of storytelling, as engagement and motivation, and explore the use of the storytelling practice as a reflective process. Finally, we discuss preliminary insights and suggestions for future studies.

CCS CONCEPTS

• **Human-centered computing** → *Empirical studies in HCI.*

KEYWORDS

Case study; Young student; Primary School; Digital Storytelling; Comics; Educational context

INTRODUCTION

Children in school often experience or witness episodes of conflict related to cultural, sociological and historical differences between diverse groups. They are used to perceive current phenomena through other sources such as media, parents and/or friends and they have few outlets to build their personal perspective [17]. In this context, we believe that providing this community with an interactive digital support can assist them in representing and reflecting on these situations and, eventually, in better dealing with them. In particular, we propose interactive digital storytelling, which combines technology and narration, as a successful guided process for the elaboration of situations involving conflicts [9]. The combination of both graphical and textual elements for the comic-based narration is proposed as motivating and engaging process through which children can meaningfully express themselves [8]. In this paper, we discuss a pilot study in which we investigate how comic-based digital storytelling, supported by a web-application, named *Communics* [6, 13] (see later box), can facilitate children in reflecting on situations involving discrimination within a primary school. In particular, the focus is on investigating two specific aspects of the intervention: (1) whether digital storytelling based on comics is an engaging and motivating medium for children for stimulating reflection and (2) how the storytelling practice is supported by the different affordances included in *Communics*.

RELATED WORK

Digital storytelling has been used in different educational context with young students for supporting different teaching and learning activities [7, 14]. Rubegni and Landoni [12], for example, introduced a digital storytelling authoring tool in a pre-school to support pre-reading and pre-writing skills development. Di Blas and Boretti [3] presented a case-study investigating how interactive storytelling could support creativity, media literacy and narration process in preschoolers. Other works [10, 11] evaluated the impact of a mobile storytelling application, named "Fiabot", on educational activities in two primary schools. These studies focused on the effect of digital storytelling on creativity, digital literacy and narrative ability in the educational context. The comics medium, meant as a combination of visuals and texts into an expressive and flexible language to convey sequences of events [5], has proven to be useful in the educational context [15, 16, 18]. Previous studies have shown the potential of traditional paper-based comics [15, 16, 18] and digital comics [1, 2] in maintaining students'

Communics: a digital tool for comic-based digital storytelling

Communics [6, 13] is a web-application for the digital production of narratives in the form of comics through the combination of graphical and textual elements. A key aspect of *Communics* is that offers a library that includes graphical and textual elements designed to help users in building story in specific context. Users can create digital narratives by choosing backgrounds and using characters, objects and emoticons from a library of graphical elements. They can also add textual material freely or by choosing from a set of pre-defined expressions available in a dedicated library. *Communics* has been designed to be used by single users to create individual stories, as well as by pairs of users to produce collaborative narratives in a turn-based activity (see Figure below).

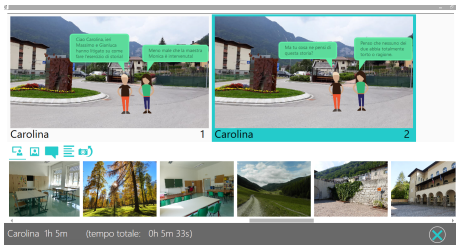

Figure 1: The *Communics* interface.

School setting. The study was conducted in a primary school, named A. De Gasperi, situated in Pieve Tesino (Trento, Italy). The class that participated in the study comprised 12 students, 7 males and 5 females, aged between 9 and 10 years old. Two teachers were involved in the project: one teaches Italian, History and Geography, the other is a special education teacher. Below, a photo of the school computer lab used in the project.

Figure 2: The computer lab of the primary school where the study took place.

engagement, in promoting emotional connection between readers and represented characters, and in enhancing concentration.

PILOT STUDY PREPARATION

The pilot study, discussed in this paper, explores the use of *Communics* for reflective practice within a primary school (see lateral box). The preparation of the pilot study included two stages: (1) the structuring of the intervention in collaboration with the teachers and (2) the content creation process, that comprises the procedure for collecting the graphical and textual elements included in *Communics*.

Structure of intervention. In order to prepare the intervention, we settled three meetings with the two teachers. At first, we interviewed them to collect information on how to integrate digital comic-based storytelling in the school curriculum. Then, we discussed the children skills in using the technology and in developing narratives, and the specific context in which to focus the narratives. The teachers were very keen to include an interactive, engaging and motivating activity to support children in elaborating situations that involve conflict, considering the classroom context.

Content creation process. The content creation process included two interviews with the teachers to identify both graphical and textual elements to be included in *Communics*. The teachers discussed daily situations involving conflict in the classroom in order to define a preliminary list of graphical and textual elements. Based on real-life episodes reported by the teachers, a set of materials (backgrounds, characters, pre-define textual elements and objects) were collected and included in the *Communics*'s library.

PILOT STUDY SETTINGS

The pilot study had the goal to investigate how digital comics, supported by different affordances provided by the digital tool, can represent a successful support for children to reflect on situations involving discrimination within the classroom. The pilot study included three sessions, as follows:
first session. In a first session, the activity with *Communics* was presented to the class. One of the researchers explained the *Communics* interface and the children were invited to use the tool both collaboratively (in pairs of two) and individually, in order to get them used to practice both conditions. (see Figure 3).
Second session. In a second session, the children were asked to use *Communics* individually. The task was to produce a narrative including an episode of conflict within the class context, and reporting a possible resolution. This resulted in the creation of ten individual stories as two children did not participated to the second sessions. At the end of the session, the children were asked to write a short text reflecting on aspects such as the advantages and disadvantages of using *Communics*, and reporting their experience.

Third session. In a third session, children worked collaboratively in pairs. The teachers assigned students in pairs, considering children with similar interests and skills, and asked them to collaboratively create a comic. Again, the task was to produce a narrative including an episode of conflict within the class and reporting a possible resolution. Six stories were produced by twelve children. At the end of the task, children were asked to reflect and write on the experience.

To gain insights on the storytelling process from the children' perspective, we analyzed the (1) pilot study observation field notes, (2) the form and content of both individual and collaborative narratives, (3) the responses to the short reports on the storytelling experience.

FINDINGS AND DISCUSSION

The goal of the study was to explore how comic-based digital storytelling can support children in the reflective practice considering situations that involve discrimination. The results are divided in two subsections, considering the two main aspects investigated in this work.

(1) Comic-based digital storytelling. From the observations, it emerged that children were positively surprised to use this type of narration at school. During the first session, in fact, they were excited in using a digital tool for creating comics during class activities. The enthusiasm persisted in the subsequent sessions, although several times the teachers were asked to upload new graphical material in *Communics* to have more characters to choose from. From the short reports written by the children, it emerged that, on one hand, they liked working with *Communics* as it was perceived as fun, engaging, and motivating. In particular, they liked to create comics, to use technology and to practice a new way for narration in the school context. P2 reported that he would have liked to train with *Communics* also at home: "I would like to have *Communics* also at home; I like it." On the other hand, they reported that they would have liked to upload their own drawings and different graphical material.

(2) Collaborative and individual work. To investigate this aspect, we evaluated both the form and the content of the produced narratives and the responses to the short reports written by the children. The 16 comics produced - 10 individually and 6 collaboratively - were analysed considering the digital tool affordances and the underlying narrative messages, including the narrative valence. In order to evaluate formal structure of the comics produced, we analysed the number of panels (i.e. the individual frame that composed a comic strip) and word balloons (i.e. the space for the speech or thoughts of a given character in the comic) included in the comics, considering also the time taken. Regarding the panels, children created collaborative narrations composed on average by 11 panels, while individual narrations were shorter, with an average of 7 panels. The average number of words balloons inserted in the collaborative narrations is 16, while for the individual narrative is 15. The number of word balloons is similar, although in the collaborative narrations a maximum of 2 balloons were placed in one panels, while in the individual a maximum of 5 word balloons were placed in one

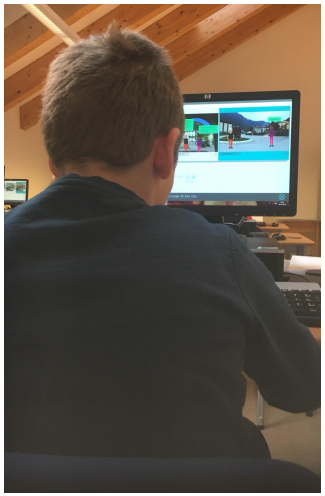

Figure 3: A participant using *Communics*

panels. Collaboratively, every participants make their contribution adding a single panel on each turn. Considering the time taken, students spent on average 82 minutes in collaboratively producing the comics, while individually they took on average 52 minutes. On one hand, collaborative stories took more time and they were composed by more panels that the individual ones. It might be argued the need to reflect before replying to the partner could have increased the working time. Since the task was to produce a narrative presenting real example of conflicting situations within the classroom and a resolution, we performed a valence analysis to assess whether the participant (i) changed the narrative to a positive situation, (ii) emphasized the negative aspects of the story increasing the conflict reported or (iii) maintained the pre-existing narration without any clear positive or negative valence. Regarding the collaborative stories, three stories reported a resolution of the conflict, while three maintained a neutral stance. Considering the individual condition, five stories reported a resolution; two a neutral stance; while two reported a conflict escalation. During the collaborative sessions, children did not find difficulties in structuring the plots, while individually the teachers had to assist five out of ten students in producing their narrative. Children reported to like working individually. Most of the them (9) reported that work individually was faster since it was not necessary to wait for their turn. P2 for example wrote: "I prefer to produce the story individually, because collaboratively I have to wait my turn." and P4 "I really like to produce comics with my classmate, but the thing that I don't like was to wait for my turn". However, they found difficulties to manage the story alone - "It was hard to manage two different characters." Only 3 participants expressed a preference for working collaboratively. P8 wrote: "Working alone was boring." and P3: "It was very hard to ask questions to yourself". P1 compared the two different conditions: "If you work alone, you work very quickly, while if you work collaboratively, it takes much more time."

CONCLUSION AND FUTURE STUDIES

In this work, we presented a pilot study on the evaluation of comic-based digital storytelling for facilitating reflection on episodes involving conflicts. From this study, we learned that digital storytelling seems a promising tool for reflecting on situations involving discrimination, although true benefits have to be further investigated. In particular, it emerged that collaborative production of stories was perceived as a slow process, but that might encourage mutual reflection. On the other hand, individual activity might be faster compared to collaborative storytelling but it might also perceived as boring. Furthermore, the collaborative activity seems to require less guidance by the teachers. Working collaboratively in pairs, in fact, helped children in generating ideas on the comic plot and structure. In the individual condition, children required a further support from the teachers for helping them in structuring the narratives. As future development of *Communics*, we plan to provide tool to better sustain collaborative activities by following the principles of Cooperative Learning [4] and to support teachers in preparing and conducting this type of interventions.

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REFERENCES

[1] Daniel Andrews and Chris Baber. 2014. Visualizing interactive narratives: employing a branching comic to tell a story and show its readings. In *Proceedings of the SIGCHI*. ACM, 1895–1904.

[2] Daniel Andrews, Chris Baber, Sergey Efremov, and Mikhail Komarov. 2012. Creating and using interactive narratives: reading and writing branching comics. In *Proceedings of the SIGCHI*. ACM, 1703–1712.

[3] Nicoletta Di Blas and Bianca Boretti. 2009. Interactive storytelling in pre-school: a case-study. In *Proceedings of the 8th International conference on interaction design and children*. ACM, 44–51.

[4] David W Johnson and Roger T Johnson. 1987. *Learning together and alone: Cooperative, competitive, and individualistic learning.* Prentice-Hall, Inc.

[5] Scott McCloud. 1993. Understanding comics: The invisible art. *Northampton, Mass* (1993).

[6] Eleonora Mencarini, Gianluca Schiavo, Alessandro Cappelletti, Oliviero Stock, and Massimo Zancanaro. 2015. Assessing a collaborative application for comic strips composition. In *Human-Computer Interaction*. Springer, 73–80.

[7] Wolfgang Müller, Ido Iurgel, Nuno Otero, and Ute Massler. 2010. Teaching English as a second language utilizing authoring tools for interactive digital storytelling. In *Conference on Interactive Digital Storytelling*. Springer, 222–227.

[8] Bonny Norton. 2003. The motivating power of comic books: Insights from Archie comic readers. *The Reading Teacher* 57, 2 (2003), 140–148.

[9] Bernard R Robin. 2008. Digital storytelling: A powerful technology tool for the 21st century classroom. *Theory into practice* 47, 3 (2008), 220–228.

[10] Elisa Rubegni and Monica Landoni. 2014. Fiabot!: design and evaluation of a mobile storytelling application for schools. In *Proceedings of the 2014 conference on Interaction design and children*. ACM, 165–174.

[11] Elisa Rubegni and Monica Landoni. 2015. Supporting creativity in designing story authoring tools. In *Proceedings of the 14th International Conference on Interaction Design and Children*. ACM, 287–290.

[12] Elisa Rubegni and Monica Landoni. 2018. How to design a digital storytelling authoring tool for developing pre-reading and pre-writing skills. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM, 395.

[13] Carolina Beniamina Rutta, Gianluca Schiavo, and Massimo Zancanaro. 2018. Interactive Digital Storytelling and Self-expression in the Context of Young Male Migrants. In *Conference on Interactive Digital Storytelling*. Springer, 621–626.

[14] Marina Umaschi. 1996. Sage storytellers: Learning about identity, language and technology. In *Proceedings of the 1996 international conference on Learning sciences*. International Society of the Learning Sciences, 526–531.

[15] Rocco Versaci. 2001. How comic books can change the way our students see literature: One teacher's perspective. *The English Journal* 91, 2 (2001), 61–67.

[16] Gene Yang. 2003. Strengths of comics in education. *Comics in Education* (2003).

[17] Chance York and Rosanne M Scholl. 2015. Youth antecedents to news media consumption: Parent and youth newspaper use, news discussion, and long-term news behavior. *Journalism & Mass Communication Quarterly* 92, 3 (2015), 681–699.

[18] Melor Md Yunus, Hadi Salehi, and Mohamed Amin Embi. 2012. Effects of using digital comics to improve ESL writing. *Research Journal of Applied Sciences, Engineering and Technology* 4, 18 (2012), 3462–3469.